

Quiz 5.1-5.3 Monday

Quiz 5.4 Wednesday

5-3 Dividing Polynomials

Poly
Mono

$$\frac{5a^2b - 15ab^3 + 10a^3b^5}{5ab}$$

$$\frac{5a^2b}{5ab} - \frac{15ab^3}{5ab} + \frac{10a^3b^5}{5ab}$$

$$a - 3b^2 + 2a^2b^4$$

Poly
Binomial

$$\begin{array}{r} 24 \\ 5 \overline{)120} \\ \underline{-10} \\ 20 \\ \underline{-20} \\ 0 \end{array}$$

$$\begin{array}{r} 30\frac{3}{5} \\ 5 \overline{)153} \\ \underline{-15} \\ 03 \\ \underline{-0} \\ 3 \end{array}$$

ex:

$$\begin{array}{r} 3y^3 - 5y^2 + y - 6 \\ y-2 \\ \hline 3y^2 + y + 3 \\ y-2 \overline{)3y^3 - 5y^2 + y - 6} \\ \underline{-3y^3 + 6y^2} \\ y^2 + y \\ \underline{-y^2 + 2y} \\ 3y - 6 \\ \underline{-3y + 6} \\ 0 \end{array}$$

ex:

$$\begin{array}{r}
 4x^4 - 19x^3 + 5x + 1 \\
 \underline{4x - 3} \\
 4x^4 - 19x^3 + 0x^2 + 5x + 1 \\
 \underline{-4x^4 + 3x^3} \\
 -16x^3 + 0x^2 + 5x + 1 \\
 \underline{+16x^3 - 12x^2} \\
 -12x^2 + 5x + 1 \\
 \underline{+12x^2 - 9x} \\
 -4x + 1 \\
 \underline{+4x - 3} \\
 -2
 \end{array}$$

$x^3 - 4x^2 - 3x - 1 + \frac{-2}{4x-3}$

Synthetic Division

where " $x - c$ " is the divisor

ex:

$$\begin{array}{r}
 3y^3 - 5y^2 + y - 6 \\
 \underline{y - 2}
 \end{array}$$

$c = 2$

$$\begin{array}{r|rrrr}
 2 & 3 & -5 & 1 & -6 \\
 & & 6 & 2 & 6 \\
 \hline
 & 3 & 1 & 3 & 0
 \end{array}$$

depressed polynomial $\rightarrow 3y^2 + y + 3$ Remainder

Do:

$$\begin{array}{r}
 2t^4 + 5t^3 - 4t^2 + 9 \\
 \underline{t + 3}
 \end{array}$$

Place holder

$$\begin{array}{r|rrrrrr}
 -3 & 2 & 5 & -4 & 0 & 9 \\
 & & -6 & 3 & 3 & -9 \\
 \hline
 & 2 & -1 & -1 & 3 & 0
 \end{array}$$

$2t^3 - t^2 - t + 3$

 $x - c$

ex:

$$\begin{array}{r}
 \frac{1}{4} \left[\begin{array}{r} 4x^4 - 19x^3 + 5x + 1 \\ \underline{4x - 3} \\ (x - \frac{3}{4}) \end{array} \right]
 \end{array}$$

$$\begin{array}{r|rrrrr}
 \frac{3}{4} & 4 & -19 & 0 & 5 & 1 \\
 & & 3 & -12 & -9 & -3 \\
 \hline
 & 4 & -16 & -12 & -4 & -2
 \end{array}$$

$$\frac{1}{4} \left[4x^3 - 16x^2 - 12x - 4 - \frac{2}{x - \frac{3}{4}} \right]$$

$$x^3 - 4x^2 - 3x - 1 - \frac{2}{4x-3}$$

HW

p236-237

15, 18, 33-43odd

(Do 2 long and 4 synthetic)